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Microelectronic Status Analysis
and Secondary Part Procureability Assessment of
MICOM Weapon Systems
(5-34687)

Final Technical Report for Period
4 February 1997 through 31 December 1997

May 1999

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PREFACE

This technical report was prepared by the staff of the Research Institute, The University of Alabama in Huntsville. The purpose of this report is to provide documentation of the work performed and results obtained under Delivery Order 119 of AMCOM Contract No. DAAH01-92-D-R006. Mr. Robert Harvey and Mr. Gary Maddux were the principal investigators. Mr. Doug Johnston, Industrial Operations Division, Systems Engineering and Production Directorate, Research, Development, and Engineering Center, U.S. Army Aviation & Missile Command, provided technical coordination.

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Prepared for: Commander
U.S. Army Aviation & Missile Command
Redstone Arsenal, AL 35898

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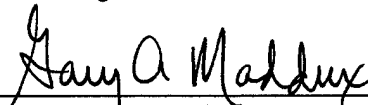

Principal Investigator

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1.0 Introduction

The Industrial Operations Division (IOD), Systems Engineering and Production Directorate (SEPD), Missile Research, Development and Engineering Center (MRDEC), U.S. Army Aviation and Missile Command (AMCOM) has the mission and function of providing microelectronic technology assessments, and producibility and supportability analyses for MICOM weapon systems. IOD was required to evaluate the impacts of nonavailability of microelectronic parts on the life cycle supportability of MICOM weapon systems and evaluate the producibility of MICOM weapon systems.

IOD required engineering support in performing microelectronic technology and availability assessments for several hundred items and in assessing the impact of nonavailability on MICOM weapon systems. IOD also required engineering support in performing producibility analyses as well as spare and repair part obsolescence management during the Tech Loop review cycle of MICOM weapon systems. In order to facilitate the assessment of these systems, the Systems Management and Production Laboratory at The University of Alabama in Huntsville Research Institute was tasked to conduct an in-depth analysis as to the life cycle health of MICOM weapon systems' component parts.

2.0 Objective

The objective of the work to be performed under this task order was to provide engineering support to analyze the availability of microelectronics used in MICOM weapon systems and to investigate and develop solutions for problem parts. Determination of the producibility of MICOM weapon systems and/or subsystems was also required.

3.0 Statement of Work

The statement of work, as outlined in delivery order 119, was as follows:

- 3.1 UAH shall analyze the availability of microelectronic parts used in MICOM weapon systems. The analyses shall be for microelectronics specifically identified by the IOD. UAH shall also identify known solutions. The analyses will be performed using government-furnished databases and automated tools such as the Microcircuit Obsolescence Analysis Tool (MOAT) local area network and with the TACTech information. Other available sources of information shall be used as required. Analyses results shall be recorded in databases that will be compatible with current government databases and delivered in digital and written report format to the government. Results also shall be presented and documented in a final report. All results shall be delivered to the government.

- 3.1.1 UAH shall define microelectronic component obsolescence assessment methods and analyze current government obsolescence assessment methods. Additional approaches shall be developed as required. Analysis methods, data sources, criteria and reporting formats shall be documented within all written reports.
- 3.1.2 UAH shall research and analyze MICOM weapon systems microelectronic component availability data. Commercial and government databases shall be searched for data on microelectronic obsolescence and availability. Approved alternate sources, part numbers and qualified substitutes for obsolete or unavailable parts shall be identified. Compliance with military standards shall be verified.
- 3.1.3 UAH shall assess MICOM weapon systems readiness, producibility, and supportability impacts resulting from microelectronic obsolescence. Specific component availability and obsolescence problems affecting the MICOM systems shall be identified. Quantitative statistics to demonstrate the impacts at the system, line replaceable unit (LRU), circuit board and component levels shall be derived as directed. Potential approaches to resolve availability and obsolescence problems and reduction of their impacts on system supportability shall be proposed as necessary.
- 3.2 UAH shall analyze the producibility of MICOM weapon systems and subsystems. The analyses will be performed on parts specifically identified by the government. UAH shall analyze TDP data (listings, engineering documentation and changes thereto) to advise the government if the present baseline and/or detail drawings are adequate for competitive procurement and/or manufacture. UAH shall provide a written report for each TDP analyzed. The report will detail any deficiencies and provide recommended solutions. UAH shall provide recommended TDP updates where applicable.
- 3.3 UAH shall perform an engineering analysis on producibility problems identified during the procurement cycle of MICOM secondary items. The analysis will require review of drawings, specifications, and related materials. Results of the analysis shall be prepared and furnished in a written report.

4.0 Assessment of MICOM Weapon Systems

Under this task members of the UAH Systems Management and Production Lab performed a detailed engineering analysis on the component parts of MICOM weapon systems. Specifically, microelectronic components were analyzed according to their availability and expected life cycle. To ascertain this information, UAH worked with the electronics industry, MICOM Project Offices, and other government agencies.

* . * *

The results of this task were compiled in a number of customized reports and delivered to IOD under separate cover.

5.0 Conclusion and Recommendations

During the time frame allocated by the delivery order, members of the UAH Systems Management and Production Lab, with the cooperation of representatives from MICOM Systems Engineering and Production Directorate and MICOM project offices investigated the life cycle supportability of the microelectronics of MICOM weapon systems. Because of the rapidly changing microelectronics industry, it is imperative that this assessment be refreshed on a periodic basis. Only through the diligent monitoring of a complex system can its sustainability issues be properly addressed. It is recommended that MICOM weapon systems adopt a proactive obsolescence management philosophy so that the total cost of ownership is reduced over the system's life cycle.